

10/731,158

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NEWS 8 MAR 03 REGISTRY/ZREGISTRY - Sequence annotations enhanced  
NEWS 9 MAR 03 MEDLINE file segment of TOXCENTER reloaded  
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NEWS 11 MAR 22 Original IDE display format returns to REGISTRY/ZREGISTRY  
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NEWS 13 MAR 22 REGISTRY/ZREGISTRY enhanced with experimental property tags  
NEWS 14 APR 04 EPFULL enhanced with additional patent information and new  
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NEWS 17 APR 25 Patent searching, including current-awareness alerts (SDIs),  
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FILE LAST UPDATED: 26 Apr 2005 (20050426/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s "zirconium dioxide"

188929 "ZIRCONIUM"

21 "ZIRCONIUMS"

188932 "ZIRCONIUM"

("ZIRCONIUM" OR "ZIRCONIUMS")

430213 "DIOXIDE"

6427 "DIOXIDES"

431834 "DIOXIDE"

("DIOXIDE" OR "DIOXIDES")

L1 8066 "ZIRCONIUM DIOXIDE"

("ZIRCONIUM" (W) "DIOXIDE")

=> s monoclinic

83884 MONOCLINIC

4 MONOCLINICS

83887 MONOCLINIC

(MONOCLINIC OR MONOCLINICS)

128 MONOCLIN

L2 84007 MONOCLINIC

(MONOCLINIC OR MONOCLIN)

=> s tetragonal

49827 TETRAGONAL

7 TETRAGONALS

L3 49830 TETRAGONAL

(TETRAGONAL OR TETRAGONALS)

=> s cubic

91518 CUBIC

22 CUBICS

L4            91525 CUBIC  
                 (CUBIC OR CUBICS)

=> s 12 or 13 or 14

L5            207250 L2 OR L3 OR L4

=> s 11 and 15

L6            1135 L1 AND L5

=> s catalyst

             686303 CATALYST

             690075 CATALYSTS

L7            879830 CATALYST  
                 (CATALYST OR CATALYSTS)

=> s 16 and 17

L8            41 L6 AND L7

=> d 18 1-41 abs ibib

L8 ANSWER 1 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB The present work has its basis on the system zirconia-sulfonate in order to study the influence in the variation of the content of the sulfonium ion, carrying out the addition of the agent in situ at a pH=1.8. Results show that solids with a tetragonal type phase, and a distribution of acid sites of order of  $H_0 = -14.52$  were obtained.

ACCESSION NUMBER: 2004:752868 CAPLUS  
 DOCUMENT NUMBER: 141:231295  
 TITLE: Characterization of acidic properties of zirconium dioxide sulfate ( $ZrO_2-SO_4$ )  
 AUTHOR(S): Sandoval-Flores, G.; Silva-Rodrigo, R.; Dominguez-Esquivel, J. M.; Ramirez, M. T.  
 CORPORATE SOURCE: Inst. Tecnológico de Cd. Madero, Division de Estudios de Posgrado e Investigacion, Los Mangos, 89440, Mex.  
 SOURCE: Revista Mexicana de Ingenieria Química (2004), 3(2), 177-180  
 CODEN: RMIQEM; ISSN: 1665-2738  
 PUBLISHER: Academia Mexicana de Investigacion y Docencia en Ingenieria Química, A.C.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Spanish  
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 2 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB Gallium-promoted sulfated zirconia (GSZ) catalysts were prepared by impregnation of zirconium hydroxide with aqueous  $Ga_2(SO_4)_3$  followed by calcination. Isomerization of n-hexane was studied over GSZ at 150°, 2.0 MP,  $WHSV$  2 and H<sub>2</sub>/hexane (molar) ratio of 5. In comparison to sulfated zirconia (SZ), the conversion of n-hexane over Gallium-promoted sulfated zirconia (GSZ) was greatly improved and it remained stable at 85%. In particular, almost all the products were isomers of hexane and the selectivity of 2,2-DMB reached 20%. The results of characterization indicated that the addition of gallium onto SZ catalyst showed little difference in acid strength between SZ and GSZ catalysts while the redox properties of the SZ catalyst changed with addition of gallium. The transformation of SZ crystalline from metastable tetragonal phase, the more active phase, to monoclinic phase was retarded with the addition of gallium. Also, the simultaneous promotion of Pt and Ga brings the production distribution very close to the equilibrium one.

ACCESSION NUMBER: 2003:741614 CAPLUS  
 DOCUMENT NUMBER: 140:61930  
 TITLE: Hydroisomerization of n-hexane over gallium-promoted sulfated zirconia  
 AUTHOR(S): Cao, Chong-jiang; Han, Song; Chen, Chang-Lin; Xu, Nan-Ping; Mou, Chun-Yuan  
 CORPORATE SOURCE: College of Chemistry and Chemical Engineering, Nanjing University of Technology, Nanjing, 210009, Peop. Rep. China  
 SOURCE: Catalysis Communications (2003), 4(10), 511-515  
 CODEN: CCAOAC; ISSN: 1566-7367  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 3 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB Colloidal crystal templates were used to synthesize three-dimensionally ordered macroporous sulfated zirconia catalysts with pore diam. of .apprx.300 nm and less. Ordered arrays of uniformly sized poly(Me methacrylate) latex spheres were infiltrated with clear precursor solns. containing varying  $SO_4/Zr$  molar ratios. After solidification of the material in the void space between the spheres, the polymer templates were removed by calcination at various temps., producing crystalline sulfated zirconia replicas of the template arrays. The effects of changing sulfate content and calcination temperature on the physicochem. properties of the material (including shrinkage, grain size, surface area, and composition) were systematically studied. The presence of sulfate retarded the crystallization and crystal growth, which enabled greater control of macropore shrinkage and periodic order of the material. The combination of crystal growth inhibition and the inherent porosity of the PMMA latex are believed to be the major factors contributing to the observed BET surface areas of the materials, which were significantly larger than those of their nontemplated counterparts and passed through a maximum as a function of calcination temperature and initial  $SO_4/Zr$  ratio. The maximum value of 123  $m^2/g$  was attained by a sample with  $SO_4/Zr = 2$ , calcined at 650°, with a sulfate surface coverage of 3.1 nm<sup>2</sup>. The n-butane isomerization activity of the material also passed through a maximum as a function of calcination temperature and initial  $SO_4/Zr$  ratio, reaching its maximum value for a sample with  $SO_4/Zr = 2$ , calcined at 600°.

ACCESSION NUMBER: 2003:382239 CAPLUS  
 DOCUMENT NUMBER: 139:103303  
 TITLE: Preparation and Catalytic Evaluation of Macroporous Crystalline Sulfated Zirconium Dioxide Templated with Colloidal Crystals  
 AUTHOR(S): Al-Daous, Mohammed A.; Stein, Andreas  
 CORPORATE SOURCE: Department of Chemistry, University of Minnesota, Minneapolis, MN, 55455, USA  
 SOURCE: Chemistry of Materials (2003), 15(13), 2638-2645  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 4 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB The invention relates to removal of nitrogen oxides from both dry and wet as well as sulfur-containing emission gases by C2-16-hydrocarbons under oxidation conditions. The catalyst and process are applicable for treating gases containing nitrogen oxides, including flue gases of heat-and-power plants, motor car exhaust gases, and nitric acid production residual gases. The catalyst includes two catalytic components. The first one is n-Me<sub>1</sub>-m Me<sub>2</sub>O<sub>2</sub>ep SO<sub>x</sub>/carrier 1, where Me<sub>1</sub> is silver, platinum, palladium, or their mixture; Me<sub>2</sub>O is cuprous or cobaltous oxide, or their mixture; SO<sub>x</sub> is adsorbed sulfur oxide (sulfuric acid decomposition product) or sulfite, or sulfate containing ammonium salts, n is  $\leq 3.0$ , m is  $\leq 6.0$ , and is  $\leq 2.0$  (on conversion to sulfur), whereas carrier 1 constitutes columnar-structure clay containing, as columns, 15-30% of zirconium oxide-based nanoparticles of the formula:  $x Me_3O/2rO_2$ , in which Me<sub>3</sub>O is aluminum oxide, iron oxide, cerium oxide, or copper oxide, or their mixture ( $x = 0-4.0$ ), or 15-20% of aluminum oxide with interlayer distance not exceeding total volume of meso- and micropores no larger than 0.25  $cm^2/g$  and sp. surface 200-370  $m^2/g$ . The second catalytic component is nMe<sub>1</sub>-m Me<sub>2</sub>O<sub>2</sub>/carrier 2, where Me<sub>1</sub> is silver, platinum, or their mixture; Me<sub>2</sub>O is cuprous, cobaltous, or nickel oxide, or their mixture, n is  $\leq 2.0$ , m is  $\leq 6.0$ , whereas carrier 1 constitutes low-temperature cubic zirconium dioxide modification stabilized by at least 1.0% calcium, strontium, or barium oxide, or their mixture with sp. surface at least 160  $m^2/g$ . Two alternative processes for treatment of emission gases using the catalyst are described, the two processes being effected either in single reactor or in two in-series connected reactors at 150° to 550° in oxidative atmospheric, where C2-16-hydrocarbons function as reducing agents.

ACCESSION NUMBER: 2003:312784 CAPLUS  
 DOCUMENT NUMBER: 139:25766  
 TITLE: Catalyst and method for removing nitrogen oxides from emission gases  
 INVENTOR(S): Kuznetsova, T. G.; Sadykov, V. A.; Sorokina, T. P.; Doronin, V. P.; Alikina, G. M.; Bunina, R. V.; Ivanova, A. S.; Matyschak, V. A.; Konin, G. A.; Rozovskii, A. Ya.; Burdeinaya, T. N.; Tret'yakov, V. F.; Ross, Julian  
 PATENT ASSIGNEE(S): Institut Kataliza im. G. K. Boreskova SO RAN, Russia  
 SOURCE: Russ., No pp. given  
 CODEN: RUXKE7  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Russian  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2194573	C1	20021220	RU 2001-125453	20010917
PRIORITY APPLN. INFO.: RU 2001-125453 20010917				

L8 ANSWER 5 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB Catalysts active in the isomerization of n-butane have been synthesized by depositing sulfate ions on well-crystallized defective cubic structures based on ZrO<sub>2</sub>. This technique for introduction of sulfates does not result in any significant changes in the bulk properties of zirconium dioxide matrix. Active sulfated catalysts were prepared on the basis of cubic solid solns. of ZrO<sub>2</sub> with calcium oxide and on the basis of cubic anion-doped ZrO<sub>2</sub>. The dependence of the catalytic activity on the amount of calcium appeared to have a maximum corresponding to 10 mol.% Ca. Radical cations formed after adsorption of chlorobenzene on activated catalysts have been used as spin probes for detection of strong acceptor sites on the surface of the catalysts and estimation of their concentration. A good correlation has been observed between the presence of such sites on a catalyst surface and its activity in isomerization of n-butane.  
 ACCESSION NUMBER: 2003:7050 CAPLUS  
 DOCUMENT NUMBER: 138:289971  
 TITLE: New approach to preparation and investigation of active sites in sulfated zirconia catalysts for skeletal isomerization of alkanes  
 AUTHOR(S): Pakhomov, N. A.; Ivanova, A. S.; Bedilo, A. F.; Moroz, E. M.; Volodin, A. M.  
 CORPORATE SOURCE: Borskov Institute of Catalysis, Novosibirsk, 630090, Russia  
 SOURCE: Studies in Surface Science and Catalysis (2002), 143(Scientific Bases for the Preparation of Heterogeneous Catalysts), 353-360  
 CODEN: SSTDM; ISSN: 0167-2991  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 6 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB The catalyst comprises  $\geq 1$  of Pd, Pt, and Rh, heat-resistant inorg. oxides such as alumina, titania, zirconia, or silica, a catalyst active component made of ZrO<sub>2</sub> containing CeO<sub>2</sub> and  $\geq 1$  oxides of Y, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sn and In, and alkaline earth metal oxides. The ZrO<sub>2</sub> containing the additives has a tetragonal single crystal structure, an excellent oxygen storage capacity, and absorption/desorption functions at 400-500°. The catalyst is suitable for removing NO<sub>x</sub>, CO, and hydrocarbons from exhaust at relatively low temps.  
 ACCESSION NUMBER: 2002:894873 CAPLUS  
 DOCUMENT NUMBER: 137:388461  
 TITLE: Exhaust treatment catalyst suitable for use at low temperature  
 INVENTOR(S): Taniguchi, Shigeo; Horiuchi, Makoto  
 PATENT ASSIGNEE(S): ICT K. K., Japan; International Catalyst Technology, Inc.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXKAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:  

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002336703	A2	20021126	JP 2001-143487	20010514

 PRIORITY APPLN. INFO.: JP 2001-143487 20010514

L8 ANSWER 7 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB ZrO<sub>2</sub>-supported La,Mn oxide catalysts with different La and Mn loadings (0.7, 2, 4, 6, 12, and 16 wt% as LaMnO<sub>3</sub>) were prepared by impregnation of tetragonal ZrO<sub>2</sub> with equimolar ams. of La and Mn citrate precursors and calcination at 1073 K. The catalysts were characterized by x-ray diffraction (XRD), x-ray absorption spectroscopy (XAS), and BET sp. surface area determination. The redox properties were tested by temperature-programmed reduction (TPR), and the catalytic tests were carried out for methane combustion at 650-1050 K and for CO oxidation at 350-800 K. XRD revealed the presence of tetragonal zirconia with traces of the monoclinic phase. LaMnO<sub>3</sub> perovskite was also detected for loading higher than 6%. XAS and TPR expts. suggested that at high loading, small crystallites of LaMnO<sub>3</sub> were formed but were not uniformly spread on the zirconia surface; on the other hand, at low loading, La and Mn oxide species interacted with the support and were difficult to be structurally defined. The catalysis study indicated that the presence of a perovskite-like structure is necessary for the development of highly active sites. Dilute catalysts were in fact poorly active even when considering the activity per g of La and Mn perovskite-like composition. For methane combustion and CO oxidation, similar trends of the activity as a function of the loading point to a similarity of the active sites for the two reactions on the examined catalytic system.  
 (c) 2002 Academic Press.  
 ACCESSION NUMBER: 2002:97818 CAPLUS  
 DOCUMENT NUMBER: 136:312152  
 TITLE: Methane Combustion and CO Oxidation on Zirconia-Supported La,Mn Oxides and LaMnO<sub>3</sub> Perovskite  
 AUTHOR(S): Cimino, S.; Colonna, S.; De Rossi, S.; Faticanti, M.; Lisi, L.; Pettiti, I.; Porta, P.  
 CORPORATE SOURCE: Dipartimento d'Ingegneria Chimica, Universita "Federico II", Naples, Italy  
 SOURCE: Journal of Catalysis (2002), 205(2), 309-317  
 CODEN: JCTLA; ISSN: 0021-9517  
 PUBLISHER: Academic Press  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 8 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB The title catalyst was prepared by adsorption-precipitation and NH<sub>3</sub>-TPD was used to measure the acidity of SO<sub>4</sub>2--ZrO<sub>2</sub>/y-Al<sub>2</sub>O<sub>3</sub>. The structure of the catalyst was characterized by IR and x-ray diffraction, the sp. surface area of catalysts was measured by BET method. The effects of preparation factors on acid site structure, acidity and catalytic activity of catalysts were studied. The results showed that the acid strength of catalysts reached the level of superacid after treated with 0.8 mol/L H<sub>2</sub>SO<sub>4</sub> and then calcined at 1043 K. ZrO<sub>2</sub> usually existed in tetragonal phase, the sulfur atom anchored to oxide surface through one S-O linkage, the sp. surface area of catalysts was generally greater than 100 m<sup>2</sup>/g.  
 ACCESSION NUMBER: 2001:568931 CAPLUS  
 DOCUMENT NUMBER: 135:294468  
 TITLE: Supported SO<sub>4</sub>2--ZrO<sub>2</sub>/y-Al<sub>2</sub>O<sub>3</sub> catalyst for hexane isomerization  
 AUTHOR(S): Zhang, Jun-sher; Zhang, Ji-yan; Wang, Ri-jie; Wang, Yan-ji  
 CORPORATE SOURCE: School of Chemical Engineering, Tianjin University, Tianjin, 300072, Peop. Rep. China  
 SOURCE: Shiyou Xuebao, Shiyou Jiaogong (2001), 17(Suppl.), 79-84  
 CODEN: SXSHY; ISSN: 1001-8719  
 PUBLISHER: Zhongguo Shihua Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 9 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Zirconia-loaded alumina samples were prepared and used as supports for platinum and tin metallic phases. X-ray diffraction patterns of 9.0 and 13.0 wt % ZrO<sub>2</sub>-loaded alumina samples showed the characteristic lines of the tetragonal ZrO<sub>2</sub> phase. For the base alumina and these two supports, the nitrogen adsorption-desorption isotherms displayed type IV isotherms and a type H1 hysteresis loop characteristic of mesoporous materials, with BET areas and pore vols. decreasing with increasing ZrO<sub>2</sub> content. Platinum and tin were incorporated into these substrates and then characterized by temperature-programmed reduction, XPS, and their performance in regard to n-butane dehydrogenation. The TPR profiles of the bimetallic systems revealed that platinum is readily reduced whereas tin reduction depends on the support, the metal loading, the preparation method, and the pretreatment conditions. Upon hydrogenation up to 773 K, tin undergoes partial reduction to the metal and the SnO/Sn<sub>2</sub>O ratio increases with increasing ZrO<sub>2</sub> content. All these systems were highly selective toward olefins (i.e., n-butenes), with a minor contribution of the isomerization and cracking reactions. The catalysts became deactivated by coke deposition, although this deactivation was less marked in the Pt-Sn deposited on the ZrO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> substrates.

ACCESSION NUMBER: 2000:839508 CAPLUS  
 DOCUMENT NUMBER: 134:133906  
 TITLE: Alumina- and Zirconia-Alumina-Loaded Tin-Platinum. Surface Features and Performance for Butane Dehydrogenation

AUTHOR(S): Larese, C.; Campos-Martin, J. M.; Fierro, J. L. G.  
 CORPORATE SOURCE: Inst. Catalisís Petroleoquímica, CSIC, Madrid, 28049, Spain  
 SOURCE: Langmuir (2000), 16(26), 10294-10300  
 CODEN: LANGD5; ISSN: 0743-7463  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 10 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB A series of M-WO<sub>3</sub>/ZrO<sub>2</sub> (WMZ) solid strong acid catalyst samples with transition metal (M = Pt, Cu, Mn, Fe, Co, Ni) were prepared, and their crystal structure, surface state and acid amount were determined by XRD, TG-DTA, H<sub>2</sub>-TPR and NH<sub>3</sub>-TPD. The results showed that ZrO<sub>2</sub> in the samples mainly existed in tetragonal phase, but its content varied with different transition metals. The sp. surface area of WMZ decreased compared with WZ. The surface state of WO<sub>3</sub> dispersed in monolayer changed only in WPTZ sample. The alkylation of isobutane with butene was studied, and the reactivity was related with the measured surface acid sites, the butene conversion over WMZ declined but the selectivity for i-C<sub>8</sub> increased compared with that over WZ. Based on the reaction mechanism, it was elucidated that the addition of transition metal had scarcely any effect on the catalytic performance.

ACCESSION NUMBER: 2000:523239 CAPLUS  
 DOCUMENT NUMBER: 133:194890  
 TITLE: Study on alkylation of isobutane with butene over WO<sub>3</sub>/ZrO<sub>2</sub> strong solid acid. II. Promotion effect of transition metal

AUTHOR(S): Sun, Wendong; Zhao, Zhenbo; Wu, Yue  
 CORPORATE SOURCE: Changchun Institute of Applied Chemistry, The Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China  
 SOURCE: Cuihua Xuebao (2000), 21(3), 229-233  
 CODEN: THEPD3; ISSN: 0253-9837  
 PUBLISHER: Kexue Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 11 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB A series of WO<sub>3</sub>/ZrO<sub>2</sub>, SO<sub>4</sub><sup>2-</sup>/ZrO<sub>2</sub>, and MoO<sub>3</sub>/ZrO<sub>2</sub> strong solid acids was prepared. Their crystal structure, surface state and acidity were determined by XRD, TG-DTA, H<sub>2</sub>-temperature-programmed reaction, and NH<sub>3</sub>-temperature-programmed desorption. The results revealed that superfine ZrO<sub>2</sub> mainly exists in tetragonal phase, however, the amount of T-phase ZrO<sub>2</sub> decreases, but it has a larger specific area, acid amts. and loading capacity as compared with catalyst prepared by traditional approach using Zr(OH)<sub>4</sub> as carrier. Acid strength of the catalyst increases with the calcination temperature, which indicates that its surface state has changed significantly. The isobutane alkylation of n-butene catalyzed by various catalysts has been investigated. Exptl. results indicated that better olefin conversions are reached compared to that over catalyst prepared by traditional Zr(OH)<sub>4</sub> as carriers. C<sub>8</sub> selectivity decreases due to the formation of more cracking products of C<sub>5</sub>-apprx.C<sub>7</sub>.

ACCESSION NUMBER: 2000:318411 CAPLUS  
 DOCUMENT NUMBER: 133:75608  
 TITLE: Study of the alkylation of isobutane with n-butenes over WO<sub>3</sub>/ZrO<sub>2</sub> strong solid acid. III. Effect of superfine ZrO<sub>2</sub> support on physico-chemical properties and catalytic behavior of the catalyst

AUTHOR(S): Sun, Wen-dong; Zhao, Zhen-bo; Liu, Yu; Wu, Yue  
 CORPORATE SOURCE: Changchun Institute of Applied Chemistry, The Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China  
 SOURCE: Fenzi Cuihua (2000), 14(2), 111-118  
 CODEN: FEUCEN; ISSN: 1001-3555  
 PUBLISHER: Kexue Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 12 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB A series of WO<sub>3</sub>/ZrO<sub>2</sub> strong solid acids, prepared under different conditions, were examined (a.g., for crystal structures and surface properties and acidities) by H<sub>2</sub> temperature-programmed reduction, laser Raman spectroscopy, and acidity measurements. Although ZrO<sub>2</sub> in WO<sub>3</sub>/ZrO<sub>2</sub> existed mainly in the tetragonal phase, WO<sub>3</sub> played an important role in the stabilization of the ZrO<sub>2</sub> tetragonal phase; thus, the catalyst had a considerable surface area. WO<sub>3</sub> in WO<sub>3</sub>/ZrO<sub>2</sub> was dispersed and crystallized in WO<sub>3</sub> crystallites on the ZrO<sub>2</sub> surface and partly reacted with ZrO<sub>2</sub> to form the Zr-O-W bond, which acted as the strong solid acid site. The catalytic properties of WO<sub>3</sub>/ZrO<sub>2</sub> strong solid acids were investigated for the alkylation of isobutane with butene. The catalysts had a better reaction performance than other strong solid acids; a parallel relationship could be drawn between the catalytic activity and the distribution of acid sites as well as the acidic strength of the catalysts.

ACCESSION NUMBER: 2000:218753 CAPLUS  
 DOCUMENT NUMBER: 132:310544  
 TITLE: Studies on the alkylation of isobutane with butene over WO<sub>3</sub>/ZrO<sub>2</sub> strong solid acid. (I) Effect of preparation, load of WO<sub>3</sub> and calcination temperature

AUTHOR(S): Sun, Wen-Dong; Zhao, Zhen-Bo; Chu, Wen-Ling; Guo, Chuan; Ye, Xing-Kai; Wu, Yue  
 CORPORATE SOURCE: Changchun Institute of Applied Chemistry, The Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China  
 SOURCE: Gaodeng Xuexiao Huaxue Xuebao (2000), 21(3), 448-452  
 CODEN: KTHPDM; ISSN: 0251-0790  
 PUBLISHER: Gaodeng Jiaoyu Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 13 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB Mox/ZrO2 catalysts were prepared by impregnation method. Their  
 structure, reduction and oxidation properties were studied with XRD,  
 temperature-programmed reaction, temperature-programmed oxidation and  
 microreaction  
 technique of CO oxidation There was strong interaction between M  
 (transition  
 metal) and ZrO2, which restrains the growth of fine particles of zirconium  
 oxide and phase transformation of tetragonal-ZrO2 to mixed-ZrO2.  
 Different transition metal oxides on ZrO2 have different reduction and  
 oxidation  
 properties. The oxidation activity order of the catalysts is CuOx  
 > CoOx > MnOx > FeOx > NiOx > CrOx  
 ACCESSION NUMBER: 1999:643161 CAPLUS  
 DOCUMENT NUMBER: 131:338563  
 TITLE: Structure and properties of ZrO2-supported transition  
 metal oxide catalysts  
 AUTHOR(S): Wang, Yue-Juan; Zhou, Ren-Xian; Jiang, Xiao-Yuan;  
 Zheng, Xiao-Ming  
 CORPORATE SOURCE: Department of Chemistry, Zhejiang Normal University,  
 Jinhua, 321004, Peop. Rep. China  
 SOURCE: Shiyou Huagong (1999), 26(9), 588-592  
 CODIN: SHHUEB; ISSN: 1000-8144  
 PUBLISHER: Shiyou Huagong Bianjibub  
 LANGUAGE: Journal  
 CHINESE

L8 ANSWER 14 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The formation of S042-/ZrO2 solid superacid is studied with FT-IR, XRD and  
 SEM techniques. Subtractive FT-IR measurement indicates the existence of  
 chemical bonds between ZrO2 and H2SO4; XRD determination reveals that the  
 strength of  
 S042-/ZrO2 superacid strongly depends on temperature of calcination and  
 reaches  
 a maximum as the ZrO2 transforms into tetragonal crystal phase.  
 SEM anal. shows that the morphol. of ZrO2 surface is changed due to  
 treatment of H2SO4. This catalyst shows higher esterification  
 activity for synthesis of di-Bu maleate which is excellently related with  
 the results of surface anal.  
 ACCESSION NUMBER: 1999:332708 CAPLUS  
 DOCUMENT NUMBER: 131:14594  
 TITLE: Studies on the formation mechanism of S042- / ZrO2  
 solid superacid  
 AUTHOR(S): Zhang, Yunhui; Xu, Yi Chen, Changou; Gu, Zhongwen  
 CORPORATE SOURCE: College of Chem. Chem. Engineering, Chongqing  
 University, 40004, Peop. Rep. China  
 SOURCE: Chongqing Daxue Xuebao, Ziran Kexueban (1999), 22(1),  
 77-81  
 CODEN: CDXKF2; ISSN: 1000-582X  
 PUBLISHER: Chongqing Daxue Xuebao Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese2

18 ANSWER 15 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
 AB The activity and durability of the catalysts prepared by the  
 oxidation-reduction treatment of amorphous Co-15 atomic% Zr, Ni-40 atomic%  
 Zr, and  
 Ni-30 atomic% Zr-10 atomic% Sm alloys were investigated for simultaneous  
 methanation of carbon monoxide and carbon dioxide. The Ni-30Zr-10Sm  
 catalyst showed the highest activity among the catalysts  
 examined; the activity of the Co-15Zr catalyst is lower than those  
 of the nickel-based catalysts, in agreement with the activity  
 for the sole methanation of carbon dioxide. On all the catalysts  
 , carbon monoxide reacts preferentially with hydrogen and is completely  
 converted into methane at 2523 K. The remaining hydrogen further  
 reacts with carbon dioxide to form methane. The methanation rate in the  
 H<sub>2</sub>-CO mixed gas was higher than that in H<sub>2</sub>-CO mixed gas without CO<sub>2</sub>.  
 This is probably related to the prevention of the formation of surface  
 carbon by disproportionation of carbon monoxide due to the presence of  
 carbon dioxide. The activity of the Ni-40Zr catalyst at 573 K  
 gradually decreased with reaction time. Tetragonal ZrO<sub>2</sub>, the  
 presence of which is responsible for the high activity, is transformed to  
 thermodynamically more stable monoclinic ZrO<sub>2</sub> during the  
 reaction. In contrast to the Ni-40Zr catalyst, the Ni-30Zr-10Sm  
 catalyst sustains the initial high activity, and no structural  
 changes were observed during the durability test regardless of the presence  
 of a small amount of H<sub>2</sub>S.  
 ACCESSION NUMBER: 1998:571532 CAPLUS  
 DOCUMENT NUMBER: 129:262645  
 TITLE: Co-methanation of carbon monoxide and carbon dioxide  
 on supported nickel and cobalt catalysts  
 prepared from amorphous alloys  
 AUTHOR(S): Hasekaki, Hiroki; Yamasaki, Michiaki; Zhang, Bo-Ping;  
 Kawashima, Aashi; Kohno, Shunpei; Takai, Takuro;  
 Hashimoto, Koji  
 CORPORATE SOURCE: Institute for Materials Research, Tohoku University,  
 Sendai, 980-8577, Japan  
 SOURCE: Applied Catalysis, A: General (1998), 172(1), 131-140  
 CODEN: ACAGEA; ISSN: 0292-860X  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE REFORMAT

18 ANSWER 16 OF 41 CAPLUS COPYRIGHT 2005 ACS ON STN  
AB ZrO<sub>2</sub>, which is 280 weight monoclinc and has a surface area  
of ≥100 m<sup>2</sup>/g, is produced by reaction of aqueous Zr salt solns. with  
NH<sub>3</sub>, aging to convert a tetragonal phase to a monoclinc  
phase at 0-300', drying, and calcining at 200-600'. The  
product is suitable as a catalyst or catalyst support,  
especially for hydrogenation, dehydrogenation, Fischer-Tropsch syntheses,  
desulfurization, isomerization, polymerization, and steam reforming.

ACCESSION NUMBER: 1998:410662 CAPLUS  
DOCUMENT NUMBER: 129:97316  
TITLE: Monoclinc zirconium  
dioxide with high surface area  
INVENTOR(S): Wulff-Doring, Joachim; Stichert, Wolfram; Schuth,  
Ferdi  
PATENT ASSIGNEE(S): BASF A.-G., Germany  
SOURCE: Eur. Pat. Appl., 9 pp.  
CODEN: EPFXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 849224	A	19980624	EP 1997-122267	19971217
EP 849224	B1	20010613		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
DE 19653629	A1	19980625	DE 1996-19653629	19961220
US 6034029	A	20000307	US 1997-992569	19971217
ES 2159804	T3	20011016	ES 1997-122267	19971217
CN 1195037	A	19981007	CN 1997-107288	19971219
JP 10350116	A2	19981215	JP 1997-352888	19971222
			DE 1996-19653629	19961220

PRIORITY APPL. INFO.:  
REFERENCE COUNT: 6

THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 17 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Pure monoclinic and tetragonal zirconium dioxides were successfully prepared at pH values of .apprx.9.5 and 11.5, rep. Their crystal structures were characterized by x-ray diffraction. Calcination temperature has a great influence upon crystals.

When calcination temperature varied from 350° to 500°, amorphous ZrO<sub>2</sub> converted to crystal phase and the amount of monoclinic phase increased, while that of tetragonal phase decreased. Different crystal phases have different catalytic performance. Monoclinic ZrO<sub>2</sub> catalyst has a higher selectivity for isobutene in F-T synthesis, while the amount of isobutene was reduced over tetragonal ZrO<sub>2</sub>. Catalytic properties of ZrO<sub>2</sub> prepared by using supercrit. fluid drying method is better than those by other methods. Reaction mechanisms are discussed.

ACCESSION NUMBER: 1997:624568 CAPLUS  
 DOCUMENT NUMBER: 127:263082  
 TITLE: Isobutene formation from synthesis gas over zirconium dioxide  
 AUTHOR(S): Wang, Guojun; Su, Guiqin; Yin, Yuanqi  
 CORPORATE SOURCE: Chinese Academy Sciences, Lanzhou Inst. Chemical Physics, Lanzhou, 730000, Peop. Rep. China  
 SOURCE: Fenzi Cuihua (1997), 11(4), 278-282  
 CODEN: FCHUAH; ISSN: 1001-3555  
 PUBLISHER: Zhongguo Kexueyuan Lanzhou Huaxue Wuli Yanjiusuo  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 18 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The activities of SO<sub>4</sub>2--MoO<sub>3</sub>-ZrO<sub>2</sub> catalysts for esterification of n-butanol with acetic acid are measured and compared with those of SO<sub>4</sub>2--ZrO<sub>2</sub> and MoO<sub>3</sub>-ZrO<sub>2</sub> catalysts. The catalyst structure was studied by XRD. SO<sub>4</sub>2--MoO<sub>3</sub>-ZrO<sub>2</sub> catalysts showed the highest catalytic activity. The tetragonal crystal system of ZrO<sub>2</sub> predominates in SO<sub>4</sub>2--MoO<sub>3</sub>-ZrO<sub>2</sub> system and the catalytic activities were prominently affected by calcination temperature and MoO<sub>3</sub> content.

ACCESSION NUMBER: 1996:733431 CAPLUS  
 DOCUMENT NUMBER: 126:9452  
 TITLE: Catalytic esterification properties of SO<sub>4</sub>2--MoO<sub>3</sub>-ZrO<sub>2</sub> catalysts  
 AUTHOR(S): Huang, Bichun; Huang, Zhongtao  
 CORPORATE SOURCE: Dep. Chemical Eng., South China Univ. Technol., Canton, 510641, Peop. Rep. China  
 SOURCE: Shiyu Huagong (1996), 25(11), 765-768  
 CODEN: SHHUE8; ISSN: 1000-9144  
 PUBLISHER: Beijing Huagong Yanjiuyuan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

L8 ANSWER 19 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Methods were explored to synthesize sulfated mesoporous zirconia with crystalline pore walls of tetragonal crystal structure. The material has been characterized by small and large angle X-ray diffraction, nitrogen physisorption, transmission electron microscopy (TEM) and catalytic tests using n-butane isomerization to iso-butane and alkylation of 1-naphthol with 4-tert-butylstyrene as probe reactions. It has been found that sulfate deposition is crucial for the transformation of a mesoporous precursor with amorphous pore walls into a material with crystalline pore walls maintaining the mesoporous morphol. with narrow pore size distributions. TEM shows no ordered stacking of the pores. As a catalyst for acid catalyzed reactions of large mols., mesoporous sulfated zirconia is superior to microporous sulfated zirconia.

ACCESSION NUMBER: 1996:723870 CAPLUS  
 DOCUMENT NUMBER: 126:91008  
 TITLE: Preparation and catalytic testing of mesoporous sulfated zirconium dioxide with partially tetragonal wall structure  
 AUTHOR(S): Huang, Yin-Yan; McCarthy, Timothy J.; Sachtler, Wolfgang M. H.  
 CORPORATE SOURCE: V.N. Ipatieff Laboratory, Center for Catalysis and Surface Science, Department of Chemistry, Northwestern University, 2137 Sheridan Road, Evanston, IL, 60208, USA  
 SOURCE: Applied Catalysis, A: General (1996), 148(1), 135-154  
 CODEN: ACAGE4; ISSN: 0926-860X  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 20 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Monoclinic, square and cubic systems of zirconium dioxide crystals were prepared, and their catalytic performance for producing lower carbon olefins from syngas was tested. A correlation of the crystal systems of ZrO<sub>2</sub> with their catalytic performance was revealed: the monoclinic system crystals favored the formation of iso-butane, and the cubic and/or square system crystals contributed to the formation of ethylene almost without the formation of C<sub>4</sub> olefins.

ACCESSION NUMBER: 1995:809446 CAPLUS  
 DOCUMENT NUMBER: 123:209786  
 TITLE: Preparation of three systems of ZrO<sub>2</sub> crystals, and their catalytic performance  
 AUTHOR(S): Li, Wen; Zhang, Wenzhong; Yin, Yuanqi  
 CORPORATE SOURCE: Lanzhou Res. Inst. Chem. Physics, Academia Sinica, Lanzhou, 730001, Peop. Rep. China  
 SOURCE: Tianranqi Huagong (1995), 20(2), 28-30  
 CODEN: THXKEF; ISSN: 1001-9219  
 PUBLISHER: Tianranqi Huagong Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese



L8 ANSWER 21 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Supported Mo oxide/ZrO<sub>2</sub> catalysts were prepared by simultaneous reaction of Zr oxychloride and ammonium heptamolybdate in molten K-Na nitrate eutectic at 773 K. Zr(IV) and Mo(VI) salts react in the molten nitrate medium, leading to solids of high sp. surface areas (5200 m<sup>2</sup>/g), which consist of small crystallites of tetragonal ZrO<sub>2</sub> containing surface polymolybdates. Textural properties of the catalysts and their stability upon air calcination were studied as a function of initial Mo/Zr ratio in the reaction mixture. Surface polymolybdate species stabilize tetragonal zirconia and improve the textural properties of the system. Surface areas twice those obtained by conventional methods were observed. Catalytic activity of samples was studied by thiophene hydrodesulfurization. Due to the enhanced surface area, Mo loading could be increased up to 12.5 weight% Mo without loss of intrinsic activity per Mo atom.

ACCESSION NUMBER: 1995:517893 CAPLUS  
 DOCUMENT NUMBER: 122:269661  
 TITLE: Preparation of high surface area Mo/ZrO<sub>2</sub> catalysts by a molten salt method: application to hydrodesulfurization  
 AUTHOR(S): Afanasiev, Pavel; Geantet, Christophe; Breyssse, Michèle  
 CORPORATE SOURCE: Inst. de Recherches sur la Catalyse, Villeurbanne, 69626, Fr.  
 SOURCE: Journal of Catalysis (1995), 153(1), 17-24  
 CODEN: JCTLA5; ISSN: 0021-9517  
 PUBLISHER: Academic  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 23 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Monoclinic ZrO<sub>2</sub> and its supported materials Co/Ni/ZrO<sub>2</sub> (Co:Ni = 1:1) for catalytic decomposition of N<sub>2</sub>O have been studied with GC, FTIR, EDAX, XPS, to evaluate catalytic activity of the materials. The monoclinic ZrO<sub>2</sub> alone has the catalytic effect for N<sub>2</sub>O decomposition, although higher activities are found for Co/Ni/ZrO<sub>2</sub> systems. XPS study shows that only Co exists in the surface region of ZrO<sub>2</sub>, which is attributed to the formation of NiO-ZrO<sub>2</sub> solid solution resulting from an interdiffusion between Ni<sup>2+</sup> and ZrO<sub>2</sub> matrix. The gas decomposition on Co/Ni/ZrO<sub>2</sub> can be described as first order with respect to partial pressure of N<sub>2</sub>O. Surface reactions on ZrO<sub>2</sub> and Co/Ni/ZrO<sub>2</sub> will also be addressed.

ACCESSION NUMBER: 1995:418130 CAPLUS  
 DOCUMENT NUMBER: 122:221420  
 TITLE: Monoclinic ZrO<sub>2</sub> and its supported materials Co/Ni/ZrO<sub>2</sub> for N<sub>2</sub>O decomposition  
 AUTHOR(S): Zeng, H. C.; Lin, J.; Teo, W. K.; Wu, J. C.; Tan, K. L.  
 CORPORATE SOURCE: Fac. Eng., Natl. Univ. Singapore, Singapore, 05111, Japan  
 SOURCE: Journal of Materials Research (1995), 10(3), 545-52  
 CODEN: JMREEE; ISSN: 0884-2914  
 PUBLISHER: Materials Research Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 22 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB A catalyst composition comprises predominantly tetragonal zirconium oxide on a neutral support. A process for converting α,β-olefinically unsatd. aldehydic or ketonic compds. into the corresponding allylic alc. derivs. using an alc. as a hydrogen donor in the presence of the catalyst on a neutral support with the catalyst selected from HfO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub>, Nb<sub>2</sub>O<sub>5</sub>, TiO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub> or their mixts. is also claimed. Acrolein was converted in 94-99% to allyl alc. with efficiencies of 84-95% using ZrO<sub>2</sub> on silica. The catalyst can be regenerated by heating in an O-containing atmospheric

ACCESSION NUMBER: 1995:426558 CAPLUS  
 DOCUMENT NUMBER: 122:164051  
 TITLE: Zirconium dioxide catalyst and process for the reduction of carbonyl compounds to alcohols  
 INVENTOR(S): Reichle, Walter Thomas  
 PATENT ASSIGNEE(S): Union Carbide Chemicals and Plastics Technology Corporation, USA  
 SOURCE: Eur. Pat. Appl., 11 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 607591	A2	19940727	EP 1993-120522	19931220
EP 607591	A3	19941102		
EP 607591	B1	19990929		
US 5354915	A	19941011	US 1992-994630	19921221
JP 06226093	A2	19940816	JP 1993-344464	19931220
JP 2864089	B2	19990303		
AT 185091	E	19991015	AT 1993-120522	19931220
ES 2136110	T3	19991116	ES 1993-120522	19931220
PRIORITY APPLN. INFO.:			US 1992-994630	A 19921221
OTHER SOURCE(S):		MARPAT 122:164051		

L8 ANSWER 24 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Temperature-programmed reduction in a H<sub>2</sub>/Ar mixture of Rh-loaded CeO<sub>2</sub>-ZrO<sub>2</sub> solid solns. with a ZrO<sub>2</sub> content varying between 10 and 90% mol and of monoclinic, tetragonal, and cubic structures is reported. It is shown that incorporation of ZrO<sub>2</sub> into a solid solution with CeO<sub>2</sub> strongly promotes bulk reduction of the Rh-loaded solid solns. in comparison to a Rh/CeO<sub>2</sub> sample. The promotion of the bulk reduction results in high oxygen storage capacity (OSC) as measured by oxygen uptake. A structural dependence of both reduction and oxidation processes is observed which is attributed to a higher oxygen mobility in the cubic structure compared to the tetragonal and monoclinic ones.

ACCESSION NUMBER: 1995:281518 CAPLUS  
 DOCUMENT NUMBER: 122:141095  
 TITLE: Rh-loaded CeO<sub>2</sub>-ZrO<sub>2</sub> solid solutions as highly efficient oxygen exchangers: dependence of the reduction behavior and the oxygen storage capacity on the structural properties  
 AUTHOR(S): Fornasiero, P.; Di Monte, R.; Rao, G. Ranga; Kaspar, J.; Meriani, S.; Trovarelli, A.; Graziani, M.  
 CORPORATE SOURCE: Dip. Sci. Chimiche, Univ. Trieste, Trieste, 34127, Italy  
 SOURCE: Journal of Catalysis (1995), 151(1), 168-77  
 CODEN: JCTLA5; ISSN: 0021-9517  
 PUBLISHER: Academic  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 25 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Thermally prepared mixed-oxide IrO<sub>2</sub>+ZrO<sub>2</sub> films were studied by Rutherford backscattering spectrometry (RBS), wide-angle x-ray scattering (WAXS) and cyclic voltammetry. Concentration depth profiling by RBS has shown that electrode films containing <50 mol.% of IrO<sub>2</sub> have layered structures where noble metal oxide and ZrO<sub>2</sub> enrichments alternate. The outermost layer is enriched with IrO<sub>2</sub>. By WAXS anal. it was possible to prove the existence of an IrO<sub>2</sub> and a ZrO<sub>2</sub> phase. From cell parameters, very limited solubility could be ascertained, restricted at the 2 limits of the composition coordinate.  
 In the range 0-20 mol.% of IrO<sub>2</sub>, a tetragonal ZrO<sub>2</sub> phase is formed. For samples richer in IrO<sub>2</sub>, the ZrO<sub>2</sub> phase becomes amorphous. The microstructural features of the tetragonal IrO<sub>2</sub>-rich phase do not change significantly with the film composition. The effective surface area of the samples, as determined by cyclic voltammetry, exhibits a maximum in the composition range 50-80 mol.% IrO<sub>2</sub>. This result was interpreted on the basis of WAXS and RBS data.  
 ACCESSION NUMBER: 1994:666365 CAPLUS  
 DOCUMENT NUMBER: 121:266365  
 TITLE: Physicochemical properties of thermally prepared Ti-supported IrO<sub>2</sub>+ZrO<sub>2</sub> electrocatalysts  
 AUTHOR(S): Benedetti, A.; Riello, P.; Battaglin, G.; De Battisti, A.; Barbieri, A.  
 CORPORATE SOURCE: Dipartimento di Chimica Fisica dell'Universita, Calle Larga S. Marta 2137, Venezia, 30123, Italy  
 SOURCE: Journal of Electroanalytical Chemistry (1994), 376(1-2), 195-202  
 CODEN: JECHES; ISSN: 0368-1874  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 27 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Using XRD, cubic crystals Ca<sub>2</sub>Zr<sub>1</sub>-xO<sub>2</sub>-x(CaF<sub>2</sub> structure) exist in the fused Fe catalysts containing ZrO<sub>2</sub> and a small amount of CaO. Fe<sub>2</sub>+ could enter monoclinic ZrO<sub>2</sub> lattices to convert it into cubic ZrO<sub>2</sub>(Fe<sub>2</sub>Zr<sub>1</sub>-xO<sub>2</sub>-x), which in turn causes a small portion of Fe<sub>2</sub>O<sub>4</sub> to be broken down to form Fe<sub>2</sub>O<sub>3</sub>(10R). SEM observation of the catalyst surface indicates that Ca<sub>2</sub>Zr<sub>1</sub>-xO<sub>2</sub>-x separates out of the α-Fe lattice and is concentrated in the cracks or channels of the reduced catalyst, while in the unreduced catalyst, Ca<sub>2</sub>Zr<sub>1</sub>-xO<sub>2</sub>-x has a relatively uniform dispersion. For the catalyst without CaO, however, ZrO<sub>2</sub> exhibits an even distribution on the surface of both reduced and unreduced catalysts. The results of the sp. surface area measurement shows that the BET surface area of the catalyst decreases somewhat as the content of ZrO<sub>2</sub> increases. By the thermoanal. technique (TG), further ZrO<sub>2</sub> promotes the reduction of the fused Fe catalyst. If ZrO<sub>2</sub> and CaO are added together to the catalyst the reduction behavior of the catalyst is greatly improved.  
 ACCESSION NUMBER: 1994:39280 CAPLUS  
 DOCUMENT NUMBER: 120:39280  
 TITLE: Study on the internal action and existence state of zirconium dioxide in fused iron catalysts of different compositions  
 AUTHOR(S): Wang, Wenxiang; Liu, Zheng; Fan, Li  
 CORPORATE SOURCE: Dep. Chem., Zhengzhou Univ., Zhengzhou, Peop. Rep. China  
 SOURCE: Journal of Solid State Chemistry (1993), 107(1), 201-10  
 CODEN: JSSCBI; ISSN: 0022-4596  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 26 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The thermal decomposition of trans-1,4,5,8-tetranitroso-1,4,5,8-tetraazadecalin (TNSTAD), a polycyclic polynitrosamine, has been studied with regard to the kinetics, mechanism, morphol., and the gaseous products thereof, using thermogravimetry (TG), DTA, IR spectroscopy, differential scanning calorimetry (DSC), X-ray diffraction (XRD) and hot-stage microscopy. The crystal structure parameters obtained from the XRD pattern are a = 10.785±0.005 Å, b = 10.785±0.005 Å, c = 18.525±0.004 Å; c/a ratio = 1.718. The crystal belongs to the tetragonal system. IR spectra of TNSTAD have also been recorded and the bands assigned. The kinetics of thermolysis has been followed by both isothermal TG and IR. The best linearity (with a correlation coefficient of 0.996) was obtained for the Jander's equation for the range 0-534 in isothermal TG. The activation energy was found to be 195.38 kJ mol<sup>-1</sup> and log(A in s<sup>-1</sup>) was 18.21. The effect of a series of additives (incorporated to the extent of 5%) on the initial thermolysis of TNSTAD has also been studied. Evolved gas anal. by IR showed that HCHO, NO<sub>2</sub>, NO and N<sub>2</sub>O are produced in larger amts. than CO<sub>2</sub> and HCN. The cleavage of the N-N bond appears to be the primary step in the thermolysis of TNSTAD.  
 ACCESSION NUMBER: 1994:54056 CAPLUS  
 DOCUMENT NUMBER: 120:54056  
 TITLE: XRD, spectroscopic and thermal analysis studies on trans-1,4,5,8-tetranitrosotetraazadecalin (TNSTAD)  
 AUTHOR(S): Prabhakaran, K. V.; Bhride, N. M.; Kurian, E. M.  
 CORPORATE SOURCE: Armament Research and Development Establishment, Pashan, Pune-411021, India  
 SOURCE: Thermochimica Acta (1993), 220(1-2), 169-83  
 CODEN: THACAS; ISSN: 0040-6031  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 28 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Pd/ZrO<sub>2</sub> catalysts highly active for the oxidation of CO can be prepared by exposing amorphous Pd-Zr alloys to CO oxidation conditions at 280°. The bulk chemical and structural changes occurring under these conditions were studied using thermoanal. methods (TG, DTA) combined with mass spectrometry and in-situ powder XRD. Amorphous PdZr<sub>2</sub> and PdZr<sub>3</sub> alloys exhibit virtually no activity when exposed to CO oxidation conditions, mainly due to their low sp. surface area (.apprx.0.01 m<sup>2</sup>/g). The activity develops with time on stream, passes through a maximum and reaches a stable state only after several hours. The maximum in the activity is observed when .apprx.50-70% of the amount of O necessary for complete oxidation of the precursor to PdO and ZrO<sub>2</sub> was consumed. The oxidation of the amorphous Pd-Zr alloys, which results in a drastic increase of the sp. surface area of the samples, starts at significantly lower temperature than the crystallization temps. of the alloys. The stable catalysts contain poorly crystalline monoclinic and tetragonal ZrO<sub>2</sub>, metallic Pd and PdO as bulk phases. The concentration of these phases is influenced by simultaneously occurring reactions, including: the oxidation of the alloy constituents by O<sub>2</sub> which results in PdO and ZrO<sub>2</sub>, the oxidation by CO<sub>2</sub> resulting in Pd and ZrO<sub>2</sub>, and the reduction of the PdO formed by CO and by metallic Zr present in the unreacted part of the alloy. The solid state reduction 2 PdO + Zr → Pd + ZrO<sub>2</sub> contributes significantly to the reduction of the PdO as long as metallic Zr is abundant in the alloys.  
 ACCESSION NUMBER: 1993:547377 CAPLUS  
 DOCUMENT NUMBER: 119:147377  
 TITLE: Transformation of glassy palladium-zirconium alloys to highly active carbon monoxide-oxidation catalysts during in situ activation studied by thermoanalytical methods and x-ray diffraction  
 AUTHOR(S): Baiker, A.; Maciejewski, M.; Tagliaferri, S.  
 CORPORATE SOURCE: Dep. Chem. Eng. Ind. Chem., Edg. Tech. Hochschule, Zurich, CH-8092, Switz.  
 SOURCE: Berichte der Bunsen-Gesellschaft (1993), 97(3), 286-92  
 CODEN: BBFCAX; ISSN: 0005-9021  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 29 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Ordinary and low-frequency Raman spectra were used to study Li aluminosilicate glasses with added ZrO<sub>2</sub> as a crystallization catalyst in various stages of secondary heat treatment. Evidence was found for phase separation of the glasses with formation of ultrafine particles of tetragonal ZrO<sub>2</sub>, and the size of the particles was determined. The matrix crystallized around the ZrO<sub>2</sub> particles. The structure of the residual glass phase in the resulting glass-ceramics is discussed. The obtained results are compared with data obtained by x-ray methods.  
 ACCESSION NUMBER: 1993:43952 CAPLUS  
 DOCUMENT NUMBER: 118:43952  
 TITLE: Raman-spectral evidence of phase separation in lithium aluminosilicate glasses containing zirconium dioxide  
 AUTHOR(S): Bobovich, Ya. S.; Zhilin, A. A.; Petrov, V. I.; Tsenter, M. Ya.; Chuvaeva, T. I.  
 CORPORATE SOURCE: Gos. Opt. Inst. im. S. I. Vavilova, St. Petersburg, Russia  
 SOURCE: Optika i Spektroskopiya (1992), 72(6), 1356-62  
 CODEN: OPSPAM; ISSN: 0030-4034  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Russian

L8 ANSWER 30 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The ZrO<sub>2</sub> catalyst supports modified with rare earth elements were prepared by copptn. from an aqueous solution of zirconium oxychloride and rare earth chlorides. The crystallization of amorphous hydrous ZrO<sub>2</sub> was inhibited by doping with rare earths; the crystallization temperature was elevated as the amount and ionic radius of the rare earth modifiers was increased. Only modification using Ce had no effect on the crystallization process. The behavior of Ce was different from that of other rare earth elements with valency 3+. A metastable cubic phase was formed for ZrO<sub>2</sub> modified with 10 mol.% La, Nd, and Sn by heating at 600°. X-ray diffraction and Raman data indicated that the metastable phase had large microstrain and short-range ordering similar to tetragonal symmetry. Rare earth-modified ZrO<sub>2</sub> showed a large surface area and good thermal stability as a catalyst support. The CO oxidation activity of Fe was enhanced by modification with Nd of ZrO<sub>2</sub> supports.  
 ACCESSION NUMBER: 1991:590746 CAPLUS  
 DOCUMENT NUMBER: 115:190746  
 TITLE: Preparation and characterization of zirconium dioxide catalyst supports modified with rare earth elements  
 AUTHOR(S): Ozawa, Masakuni; Kimura, Mareo  
 CORPORATE SOURCE: Toyota Cent. Res. Dev. Lab., Inc., Nagakute, 480-11, Japan  
 SOURCE: Journal of the Less-Common Metals (1991), 171(2), 195-212  
 CODEN: JCOMAH; ISSN: 0022-5088  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 31 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The activity of monoclinic ZrO<sub>2</sub> (baddeleyite) in ammonolysis of o-xylene (I) at 360° was an order of magnitude higher than the activity of tetragonal ZrO<sub>2</sub> (ruffite). Ammonolysis of I in the presence of baddeleyite yielded 28% o-tolynitrile and 12% benzonitrile, whereas in the presence of ruffite phthalimide was formed with 35% selectivity and 40% of I was oxidized to CO and CO<sub>2</sub>.  
 ACCESSION NUMBER: 1990:461701 CAPLUS  
 DOCUMENT NUMBER: 113:61701  
 TITLE: Oxidative ammonolysis of o-xylene on zirconium dioxide  
 AUTHOR(S): Chukhno, N. I.; Ivanovskaya, F. A.; Sembaev, D. Kh.  
 CORPORATE SOURCE: Inst. Khim. Nauk, Alma-Ata, USSR  
 SOURCE: Izvestiya Akademii Nauk Kazakhskoi SSR, Seriya Khimicheskaya (1990), (3), 55-6  
 CODEN: IKAKAK; ISSN: 0002-3205  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Russian

L8 ANSWER 32 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB A SO<sub>3</sub>-promoted ZrO<sub>2</sub>/SiO<sub>2</sub> catalyst is a solid superacid with acid strength H<sub>0</sub> > -13.16, regardless of the amount of ZrO<sub>2</sub> loaded. The sample with the highest ZrO<sub>2</sub> loading of 3.5 mmol g<sup>-1</sup> showed the highest acid strength of H<sub>0</sub> < -14.52. A tetragonal form of ZrO<sub>2</sub> grew extensively with the greater ZrO<sub>2</sub> loadings. The higher acid strength is attributed to the crystal growth of supported oxide.  
 ACCESSION NUMBER: 1989:64355 CAPLUS  
 DOCUMENT NUMBER: 110:64355  
 TITLE: Acid property of sulfur-promoted zirconium oxide on silica as solid superacid  
 AUTHOR(S): Ishida, Toshio; Yamaguchi, Tsutomu; Tanabe, Kozo  
 CORPORATE SOURCE: Fac. Sci., Hokkaido Univ., Sapporo, 060, Japan  
 SOURCE: Chemistry Letters (1988), (11), 1869-72  
 CODEN: CHLTAG; ISSN: 0366-7022  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 33 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB LaCoO<sub>3</sub> and La<sub>0.8</sub>Sr<sub>0.2</sub>CoO<sub>3</sub> highly dispersed on ZrO<sub>2</sub> were prepared by impregnating ZrO<sub>2</sub> with aqueous solns. of the mixts. of La, Sr, and Co acetates. The high dispersion was confirmed by IR, XRD, TEM, adsorption of NO and XPS. The intensity of IR band of adsorbed pyridine at 1446 cm<sup>-1</sup> (coordinated with Zr<sup>4+</sup>) decreased with the increase in the amount of LaCoO<sub>3</sub> loaded and the band almost disappeared at about monolayer coverage. This showed that the surface of ZrO<sub>2</sub> was covered by mixed oxides having a perovskite composition. Up to about monolayer coverage, no phases other than monoclinic ZrO<sub>2</sub> were detected by XRD and no segregated particles of perovskite by TEM measurements. The variation of the XPS band intensities with the amount of the perovskite loaded was well explained by assuming the high dispersion of the perovskite. The catalysts thus prepared showed very high catalytic activities for the complete oxidation of propane.

ACCESSION NUMBER: 1989:59859 CAPLUS  
 DOCUMENT NUMBER: 110:59859  
 TITLE: Synthesis and catalytic properties of thin films of perovskite-type mixed oxides  
 AUTHOR(S): Mizuno, Noritaka; Fujii, Hiroaki; Misono, Makoto  
 CORPORATE SOURCE: Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SOURCE: Shokubai (1988), 30(6), 392-5  
 CODEN: SHKUAJ; ISSN: 0559-8958  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Japanese

L8 ANSWER 34 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The formation of cubic ZnO<sub>2</sub> stabilized with Ni(II) was studied and the structural properties of the catalyst were related with its stability in reducing atmospheres. These properties were then compared to those of catalysts prepared by incipient wetness. Changes in the structure of ZrO<sub>2</sub> and in the temps. at which reduction of Ni(II) to Ni metal occurred were then related to the relative strengths of the catalyst-support interaction.

ACCESSION NUMBER: 1988:174224 CAPLUS  
 DOCUMENT NUMBER: 108:174224  
 TITLE: Preparation and properties of cubic zirconia stabilized with nickel(II)  
 AUTHOR(S): Smith, K. E.; Kershaw, R.; Dwight, K.; Wold, A.  
 CORPORATE SOURCE: Dep. Chem., Brown Univ., Providence, RI, USA  
 SOURCE: Report (1987), TR-5; Order No. AD-A180314, 10 pp.  
 Avail.: NTIS  
 From: Gov. Rep. Announce. Index (U. S.) 1987, 87(17), Abstr. No. 737,007  
 DOCUMENT TYPE: Report  
 LANGUAGE: English

L8 ANSWER 35 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The title support for catalysts contains Zr 50-99.9 and 21 rare earth element 0.1-50% in atomic ratio. The support is prepared by mixing an alkali and a solution containing Zr and a rare earth element, washing the resulting copptd. powder, and then baking. A solution containing ZrOCl<sub>2</sub>.8H<sub>2</sub>O and NdCl<sub>3</sub>.nH<sub>2</sub>O [Zr/Nd (atomic ratio) 95:5] was neutralized with aqueous NH<sub>3</sub> to obtain a copptd. powder, which was baked at 600° to obtain a support with a sp. surface area (a) 60.5 m<sup>2</sup>/g and tetragonal ratio (r) 86 volumet, vs. 45.6 m<sup>2</sup>/g and 41 volumet, resp., without the Nd. The support was further baked at 1000°, showing a 20.8 m<sup>2</sup>/g and r 86 volumet, vs. 5.5 m<sup>2</sup>/g and 2 volumet, resp., without the Nd.

ACCESSION NUMBER: 1988:44582 CAPLUS  
 DOCUMENT NUMBER: 108:44582  
 TITLE: Zirconia catalyst support with heat resistance and high specific surface area and its preparation  
 INVENTOR(S): Ozawa, Masakuni; Kimura, Masao; Hasegawa, Hideo  
 PATENT ASSIGNEE(S): Toyota Central Research and Development Laboratories, Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
 CODEN: JKKXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62168544	A2	19870724	JP 1986-9424	19860120
JP 06004133	B4	19940119		

PRIORITY APPLN. INFO.: JP 1986-9424 19860120

L8 ANSWER 36 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The textural stabilization of non-porous ZrO<sub>2</sub> was obtained by addition of La<sub>2</sub>O<sub>3</sub> or Y<sub>2</sub>O<sub>3</sub>. The improved stability of the promoted ZrO<sub>2</sub> is due to the structural stabilization of the tetragonal form of ZrO<sub>2</sub>.

ACCESSION NUMBER: 1987:163128 CAPLUS  
 DOCUMENT NUMBER: 106:163128  
 TITLE: Nonporous stabilized zirconia particles as support for catalysts  
 AUTHOR(S): Turlier, P.; Dalmon, J. A.; Martin, G. A.; Vergnon, P.  
 CORPORATE SOURCE: Inst. Rech. Catalyse, Univ. Claude Bernard, Villeurbanne, 69626, Fr.  
 SOURCE: Applied Catalysis (1987), 29(2), 305-10  
 CODEN: APCADI; ISSN: 0166-9834  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 37 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Metal-support interactions are proposed to explain a much lower chemisorption of H on Rh/ZrO<sub>2</sub> compared to Rh/γ-Al<sub>2</sub>O<sub>3</sub> catalysts. The decrease in H chemisorption, while retaining the ability to chemisorb O, is a characteristic of strong metal-support interactions. Well dispersed samples of Rh<sub>2</sub>O<sub>3</sub> on ZrO<sub>2</sub> were prepared and the structural properties of the catalysts were related to their stability in reducing atmospheres. Changes in the structure of the phases formed and the temps. at which reduction to Rh metal occurred were then related to the relative strengths of the catalyst-support interactions. A comparison of the stability towards reduction of the bulk and dispersed Rh<sub>2</sub>O<sub>3</sub> demonstrates the influence of an interaction between the dispersed metal oxide and the support.

ACCESSION NUMBER: 1987:39138 CAPLUS  
 DOCUMENT NUMBER: 106:39138  
 TITLE: Preparation and characterization of dispersed rhodium oxide on tetragonal zirconium oxide  
 AUTHOR(S): Zhang, Y. C.; Dwight, K.; Wold, Aaron  
 CORPORATE SOURCE: Dep. Chem., Brown Univ., Providence, RI, USA  
 SOURCE: Report (1986), TR-39; Order No. AD-A166345/9/GAR, 8 pp. Avail.: NTIS  
 FROM: Gov. Rep. Announce. Index (U. S.) 1986, 86(15), Abstr. No. 633,336  
 DOCUMENT TYPE: Report  
 LANGUAGE: English

L8 ANSWER 38 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB Samples of well dispersed hexagonal Rh<sub>2</sub>O<sub>3</sub> on tetragonal ZrO<sub>2</sub> were prepared by the codecompn. of the nitrates at 900°. A comparison of the stability towards reduction of the bulk and dispersed Rh<sub>2</sub>O<sub>3</sub> products demonstrates the influence of an interaction between the dispersed metal oxide and the support.

ACCESSION NUMBER: 1986:540572 CAPLUS  
 DOCUMENT NUMBER: 105:140572  
 TITLE: Preparation and characterization of dispersed rhodium oxide (Rh<sub>2</sub>O<sub>3</sub>) on tetragonal zirconium dioxide  
 AUTHOR(S): Zhang, Y. C.; Dwight, K.; Wold, A.  
 CORPORATE SOURCE: Chem. Dep., Brown Univ., Providence, RI, 02912, USA  
 SOURCE: Materials Research Bulletin (1986), 21(7), 853-8  
 CODEN: MRBUAC; ISSN: 0025-5408  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

L8 ANSWER 39 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB NdFO, CeFO, Nd<sub>0.5</sub>Ce<sub>0.5</sub>FO, Nd<sub>0.5</sub>Y<sub>0.5</sub>FO, (NdFO)<sub>0.9</sub>(Nb<sub>2</sub>O<sub>5</sub>)<sub>0.1</sub>, (ZrO<sub>2</sub>)<sub>0.7</sub>(NdF<sub>3</sub>)<sub>0.3</sub>, and (ZrO<sub>2</sub>)<sub>0.7</sub>(SmF<sub>3</sub>)<sub>0.3</sub> were obtained by high-temperature reactions between rare earth fluorides and rare-earth or Zr oxides. The formation of Nd fluoride oxides and their properties as an electrocatalyst and/or a fuel-cell solid electrolyte were studied by x-ray diffraction and electrochem. methods. An equimolar mixture of NdF<sub>3</sub> and Nd<sub>2</sub>O<sub>3</sub> reacted quant. at >1100° in Ar to give NdFO. The crystal structure of NdFO was affected by the reaction temperature and the cooling procedure. The different crystal phases and their transformations were studied. The cubic NdFO, with a fluorite type structure, was electrocatalytically active for both the H oxidation and O reduction. The cubic phase compound (NdFO)<sub>0.9</sub>(Nb<sub>2</sub>O<sub>5</sub>)<sub>0.1</sub>, obtained by the addition of Nb<sub>2</sub>O<sub>5</sub> to the cubic NdFO at 1250°, had a higher catalytic activity and the O-ion conductivity than NdFO or the stabilized ZrO<sub>2</sub>.

ACCESSION NUMBER: 1983:57142 CAPLUS  
 DOCUMENT NUMBER: 98:57142  
 TITLE: Preparation and physical properties of rare earth fluoride oxides. 1. Preparation of neodymium fluoride oxides and application to electrocatalysts or solid electrolytes  
 AUTHOR(S): Takashima, Masayuki; Kanoh, Gentaro; Konishi, Hajime  
 CORPORATE SOURCE: Fac. Eng., Fukui Univ., Fukui, 910, Japan  
 SOURCE: Nippon Kagaku Kaishi (1982), (12), 1896-902  
 CODEN: NKAKB8; ISSN: 0369-4577  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Japanese

L8 ANSWER 40 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB The rate of the reaction between ZrO<sub>2</sub> and Nd<sub>2</sub>O<sub>3</sub> at 1200-1500° decreases with increased percent content of Nd<sub>2</sub>O<sub>3</sub>. The rate consts. at various temps. as a function of the composition of the starting mixture are given. The interaction between Nd<sub>2</sub>O<sub>3</sub> and ZrO<sub>2</sub> (free of HfO<sub>2</sub>) proceeds with a higher activation energy than when a slight HfO<sub>2</sub> impurity is present. For mixts. of the composition Nd<sub>2</sub>O<sub>3</sub> + 2ZrO<sub>2</sub>, the final product is the compound Nd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> with a pyrochlore structure and the lattice parameter 10.64 Å. Its quantity increases with increased temperature and firing time. An intermediate product for this mixture is the cubic solid solution with the lattice parameter 10.42 Å. When the mixture is calcined at 1500° for 8 hr the intermediate solid solution disappears completely. Unilateral diffusion of Nd<sub>2</sub>O<sub>3</sub> into ZrO<sub>2</sub> is indicated. The principal product is the cubic solid solution of composition Zr<sub>0.67</sub>Nd<sub>0.33</sub>O<sub>1.84</sub>.

ACCESSION NUMBER: 1972:77086 CAPLUS  
 DOCUMENT NUMBER: 76:77086  
 TITLE: Formation of solid solutions and compounds in the neodymium sesquioxide-zirconium dioxide system  
 AUTHOR(S): Krzhizhanovskaya, V. A.; Gulshkova, V. B.  
 CORPORATE SOURCE: Inst. Khim. Silik. Im. Grebenshchikova, Leningrad, USSR  
 SOURCE: Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy (1972), 8(1), 127-32  
 CODEN: IYNMAW; ISSN: 0002-337X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Russian

L8 ANSWER 41 OF 41 CAPLUS COPYRIGHT 2005 ACS on STN  
 AB ZrO2 exists in amorphous, tetragonal, and monoclinic  
 forms, and all can be converted to the monoclinic form by  
 heating above 600°. The presence of Si or Fe in various forms  
 presents obstacles to production of the monoclinic form, which  
 is used as a high-grade white opacifier in ceramic glaze or in paints.  
 When heated with Si, the formation of slag causes difficulty in  
 pulverization and resultant poor color from abrasion of the pulverizer.  
 When Fe is present, obnoxious yellow colors result. This is prevented by  
 using 0.25-5.0% Li2O (as Li2O or other Li compds. which decompose on heating  
 to Li2O) as a catalyst. Heating is from 600° to  
 950° until the entire mass is converted to monoclinic  
 form, which is best determined by x-ray diffraction. This can be  
 accomplished  
 by rotary, muffle, or Wedge furnace. The converted ZrO2 is pulverized to  
 a fineness of less than 0.5% retained on a 325-mesh screen.  
 ACCESSION NUMBER: 1949:7413 CAPLUS  
 DOCUMENT NUMBER: 43:7413  
 ORIGINAL REFERENCE NO.: 43:1580a-c  
 TITLE: Zirconia opacifiers  
 INVENTOR(S): Hurd, Loren C.; Weyden, Allen J. Vander; Stroupe,  
 James D.  
 PATENT ASSIGNEE(S): Rohm & Haas Co.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2455123		19481130	US	

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COST IN U.S. DOLLARS

SINCE FILE  
ENTRY  
124.94

TOTAL  
SESSION  
125.15

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE  
ENTRY  
-29.93

TOTAL  
SESSION  
-29.93

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STN INTERNATIONAL LOGOFF AT 17:18:27 ON 27 APR 2005

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	219	(564/472).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:23
L2	266	(564/473).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:23
L3	319	(564/479).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:23
L4	350	(564/480).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L5	139	(564/401).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L6	273	(564/402).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L7	123	(564/403).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L8	236	(564/397).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L9	236	(564/398).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/04/27 17:24
L10	1536	I1 or I2 or I3 or I4 or I5 or I6 or I7 or I8 or I9	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 17:24
L11	4857	zirconium adj dioxide	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 17:25
L12	33	I10 and I11	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 17:25



10/731, 15P

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4857	Zirconium adj dioxide	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 18:27
L2	0	precipitate adj onto	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 18:27
L3	0	precipitate adj on	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 18:27
L4	0	precipitat\$5 adj onto	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 18:28
L5	4	precipitat\$5 adj on	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/27 18:28